

2013 UDOT RESEARCH PROBLEM STATEMENT

*** Problem statement deadline is March 25, 2013. Submit statements to Steve Bagley at sbagley@utah.gov ***

Problem Title: Precast Concrete Pavements for Urban Intersection Reconstruction

No. UT-13.07.03

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UDOT Champion (suggested):

Select a Subject Area

☐ Materials/Pavements

☐ Maintenance

☐ Traffic Mgmt/Safety

☐ Geotechnical

☐ Preconstruction

☐ Planning/Asset Mgmt

☒ Transportation Innovation

1. Describe the problem to be addressed.

Reconstruction of pavements at busy urban intersections can involve significant delays to the traveling public due to reduction of lanes during construction. One way to potentially reduce traffic delays during intersection reconstruction is to use precast concrete pavement panels, placed mainly at night during low traffic volumes, thereby accelerating the reconstruction and having minimal impact on the intersection traffic. Research involvement in UDOT's first precast intersection would be to document lessons learned and help set the stage for streamlining the process and reducing cost on future precast intersection projects.

2. Describe why this research is important and how it is unique.

A flagship precast intersection reconstruction project at UDOT could potentially reduce traffic delays through the intersection during reconstruction, and the associated lessons-learned research could aid future intersection reconstruction projects considering the precast pavement option. UDOT has had success in recent years with various precast concrete pavement designs for intermittent replacement of distressed pavement panels on freeways. Application of precast pavements to an intersection poses some unique challenges, including multiple streets and turning movements and the required ability of designers and precasters to account for the base grading, utility access/manholes, and surface drainage in the precast panels during their design and precast activities. With time and additional projects, designers and precasters could improve the process and the cost might come down.

3. List the research objective(s) to be accomplished:

1. Explore options for supplemental funding to enable a planned UDOT project to implement a precast concrete intersection.
2. Facilitate a lessons learned effort during the preconstruction and construction phases of the precast concrete intersection project.

4. List the major tasks to accomplish the research objective(s):

1. Conduct a literature and project review across the country for precast intersection projects and technologies.
2. Possibly assemble a scanning tour group from UDOT, designers, and contractors to travel and learn from a few states where precast intersections have been used successfully. At a minimum, identify current barriers to implementation at UDOT and field questions to experienced states to help us overcome the barriers and plan our project.
3. Evaluate the potential traffic delay (user cost) reduction from implementing a precast intersection during a UDOT intersection reconstruction project.
4. Select a UDOT project on which to implement a precast concrete intersection, and secure supplemental funding to assist in paying the extra preconstruction and construction costs.
5. Facilitate design/construction methodology selection and associated precast trials.
6. Document lessons learned in preconstruction and construction phases.
7. Prepare a lessons learned report and share with UDOT, designers, and contractors to help on future precast intersections.

5. List the deliverable(s) to come to UDOT from this research study:

1. Lessons learned report and presentations.

6. Describe how the results of this study will be implemented at UDOT.

Lessons learned from the initial precast intersection project could help to streamline the process and bring down the cost for future precast intersection projects.

7. Estimated cost - Total: \$Large - TBD **UDOT Share:** \$Large - TBD **Other/Matching Funds:** \$

8. Outline the proposed schedule for this study, including estimated start date, duration, and major event dates.

Estimated 1 to 2 year process to identify project and funding and to implement a chosen design and construction process on one project.

